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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,048	06/20/2003	Dimitri Chernyak	018158-021800US	8453

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EXAMINER	
SANDERS JR, JOHN R	
ART UNIT	**PAPER NUMBER**
3735	

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/601,048	CHERNYAK ET AL.	
	Examin r	Art Unit	
	John R. Sanders	3735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-15 and 17-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-15 and 17-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 17 March 2006. These drawings are acceptable.

Response to Arguments

2. Applicant's arguments with respect to claims 1-5, 6-15 and 17-37 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, 7-10, 13-15, 17-26 and 29-37 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent Application Publication No. 2001/0041884 A1 to Frey et al ("Frey") in view of U.S. Patent No. 6,738,511 to Farrell et al ("Farrell").

Frey discloses a method for determining the wavefront aberrations of the eye, determining an optical correction for the eye based on said wavefront aberrations, and subsequently determining a laser ablation profile for ablating the eye to achieve said optical correction (abstract). Frey discloses aligning the eye with the probe beam path for wavefront measurement based upon the video image of the eye from a video imaging path (paragraph 31).

Frey discloses projecting light for reflection from the retina to be detected using a Hartmann-Shack wavefront sensor in order to measure across the pupil of the eye a set of local gradients corresponding to displaced spots produced by the lenslets in the Hartmann-Shack sensor (paragraphs 90-108). Frey discloses reconstructing the wavefront surface from the measured gradients with Zernike polynomials, but also discloses that other mathematical approaches can be used to approximate the distorted wavefront surface, including Fourier (paragraph 108).

Frey discloses determining a laser ablation treatment profile from the reconstructed wavefront, said laser treatment ablating a specified thickness from the cornea to effect the optical correction (paragraphs 199-219). Though Frey is primarily concerned with a reconstruction method based on Zernike polynomials, Frey expressly discloses the applicability of Fourier-based reconstruction. Thus, if Frey does not necessarily anticipate applying a Fourier transform to the measured gradients, one of ordinary skill in the art at least would find it obvious to do so based upon the suggestion by Frey of Fourier reconstruction as a viable alternative to Zernike polynomial reconstruction.

Frey discloses the above limitations but does not expressly disclose adjusting adding a mean gradient field to remove a tilt from the reconstructed surface. Farrell teaches a method for reconstructing a surface profile by converting a phase map to a gradient map. Farrell teaches the desirability of removing a tilt component from the phase difference measurements as a step in calculating the surface profile (col. 1, lines 49-54). Farrell further teaches that the tilt removed from the phase data is determined from calculating an average slope from slope data differentiated from the phase data (col. 3, lines 31-42).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Frey to adjust the gradients obtained by the means disclosed by Frey, i.e. a wavefront sensor, said adjustment made in view of a mean gradient field, as taught by Farrell, in order to remove a measured tilt from the reconstructed surface.

5. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey in view of Farrell, as applied to claim 1 above, and further in view of *Wavefront reconstruction using iterative Fourier transforms*, Applied Optics, 30:11 1325-1327 (1991) to Roddier et al ("Roddier"), of record.

Frey discloses applying Fourier-based reconstruction as previously discussed but does not expressly disclose applying a discrete Fourier decomposition and an inverse discrete Fourier transform. Roddier teaches wavefront construction using iterative Fourier transforms wherein an FFT algorithm is used to take the transform of arrays of sampled x and y slopes and then an inverse Fourier transform is applied (page 1325, column 2). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Frey to apply the discrete Fourier transform and inverse Fourier transform as taught by Roddier in order to reconstruct the wavefront from the sampled wavefront slopes.

6. Claim 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey in view of Farrell, as applied to claim 20 above, and further in view of U.S. Patent No. 5,777,719 to Williams et al. ("Williams").

Frey discloses the above limitations but does not expressly disclose an adaptive optical element coupled to the processor. Williams teaches a device for measurement of wavefront aberrations of the eye with a Hartmann-Shack camera wherein a deformable mirror (118, fig. 1) is used in feedback with the processor to determine a wavefront profile for the eye. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Frey to incorporate an adaptive optical element, as taught by Williams, in order to obtain stable wavefront measurements over time.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John R. Sanders whose telephone number is (571) 272-4742. The examiner can normally be reached on M-F 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor, II can be reached on (571) 272-4730. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JRD

25 May 2006

Charles A Marmor, II
SPE, Art Unit 3735